Weekly Report
01/26/2015 - 02/01/2015

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February 1, 2015

1 Summary

This week I mainly focus on the data inspection project.

2 Projects

2.1 Project 1 - Rank Visualization

The first version of user study section is done. The first complete version will be done next week.

2.2 Project 2 - Data Inspection

Taking every view as an object, we can construct quartets towards all the views. What's next is to construct a category tree with the quartets. The category tree construction behind quartet analysis includes two steps: embedding and partitioning.
The embedding process is conducted based on a simple intention: keeping highly correlated views close and vice versa. To achieve the goal, it embeds all views on a three-dimensional sphere with optimization of

$$\sum_{1\leq j\leq k} C(a_j, b_j, c_j, d_j) - \sum_{1\leq j\leq k} F(a_j, b_j, c_j, d_j)$$

where $C(a, b, c, d) = (\widehat{a, b} + \widehat{c, d})/2$, $C(a, b, c, d) = (\widehat{a, c} + \widehat{a, d} + \widehat{b, c} + \widehat{b, d})/4$, and $\widehat{a, b}$ is the angle between a and b on the sphere.
The partitioning process is also obtained with an optimization of the max-cut expression

$$\sum_{e_{ij}\in G} \widehat{i, j} - \alpha * \sum_{e_{ij}\in B} \widehat{i, j}$$

where G and B represents good cuts and bad cuts respectively. And by good cuts, we mean those cut uncorrelated views apart while maintaining correlated

views connected, and vice versa. The process is conducted in a top-down divide-and-conquer manner which recursively cuts the remaining graph into two parts to maximize the expression. The best α is obtained by probing iteratively to its best.
Currently I've implemented the embedding part and the divide-and-conquer part. But I'm still confused with the overall process and how the graph-cut of the underlying graph is conducted because it's not the same with what's described in the original quartet max-cuts paper. I'm looking for help from the first author of this paper.
I"m planning to start the server thing and integrate the algorithms together in the winter vacation.

2.3 Project 3 - NBA Game Visualization

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3 Paper Reading

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4 Miscellaneous

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5 To Do List

1. Data inspection project — quartet implementation.